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THE
ONTARIO WATER RESOURCES
COMMISSION

WATER POLLUTION SURVEY

of the

COMMUNITY OF WYBORN

TOWNSHIP OF WAY

1971



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CADON
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Report

on a

WATER POLLUTION SURVEY

of

COMMUNITY OF WYBORN

TOWNSHIP OF WAY

District of Cochrane

November 1971

DISTRICT ENGINEERS BRANCH

DIVISION OF SANITARY ENGINEERING

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R E P O R T

THE ONTARIO WATER RESOURCES COMMISSION

I INTRODUCTION

The Ontario Water Resources Commission is responsible for the management of the province's water resources specifically as they are related to domestic and industrial requirements, recreational uses and proper disposal of wastewaters. In keeping with this responsibility the commission examines water quality in areas of active and potential use. This survey was undertaken to locate and record any significant sources of water pollution in the unorganized community of Wyborn and surrounding area, and to present recommendations concerning their abatement.

In June of 1971, water samples for bacteriological examinations and chemical analyses were collected from the local water-courses. The appendix to the report includes the laboratory results of these samples, an interpretation of the various laboratory examinations and analyses, and an outline of the commission's surface water and effluent objectives. A map of the community showing the sampling point locations is also appended.

II GENERAL

(1) Location

The community of Wyborn has an approximate population of 115 persons and is located immediately west of the Town of Hearst near Highway No. 11. The only form of commercial development in or near the community is a trailer court located on the north side of the highway. There are no industries located in the area.

(2) Drainage

Drainage throughout the townsite is directed to the Mattawishkwia River which is located on the south side of the community. All surface drainage from Wyborn discharges to the river at a point located approximately one mile upstream from the Town of Hearst municipal water works intake.

(3) Topography

Soil conditions throughout the townsite and surrounding area consist mainly of a mixed clay and silt overburden typical of Northern Ontario. Generally, the terrain is of a flat and rolling nature with no apparent rock outcroppings.

III WATER USAGE

(1) Water Supply

There is no communal water works in Wyborn. Two homes located on the north shore of the Mattawishkwia River pump river water into their homes for domestic purposes other than drinking. Reportedly, the occupants of these homes obtain well water for drinking purposes from nearby neighbours. The remaining homes in Wyborn and the surrounding area obtain water for all domestic purposes from private wells. One central well serves all of the trailers in a trailer court located on the north side of Highway No. 11.

The results of samples collected from various wells throughout the area indicate that some of them contain water of doubtful bacteriological quality. Field observations at the time of the survey would seem to attribute adverse results to poor well construction or to the location of wells in proximity to waste disposal systems.

(2) Recreational

There are no public beach facilities in either the community of Wyborn or the Town of Hearst. The Mattawishkwia River is therefore used only to a minor extent for swimming. Pleasure boating and fishing is somewhat more frequent.

IV WATER POLLUTION CONTROL

(1) Sanitary Waste Disposal

There are no municipal sewage facilities within the community. Sewage disposal is accomplished by individually-owned septic tanks and tile beds or outdoor pit privies. The disposal of sanitary wastes by these systems is made difficult by the clay and silt overburden which prevails throughout this clay belt region. In order for a septic tank and tile bed system to perform effectively the soil must be suitable for the absorption of effluent, i.e. an acceptable percolation rate without interference with ground water or impervious strata creating a shallow absorption field. These conditions do not prevail throughout most of the area.

(2) Refuse Disposal

There is no municipal garbage collection service available to the residents of Wyborn. Reportedly, there is a private contractor in the area offering a weekly collection service for a nominal charge. However, very few of the residents are patronizing this service. The

Department of Lands and Forests operates and maintains a sanitary landfill site located in the Township of Kendall to serve the residents of Wyborn and vicinity.

V WATER POLLUTION SURVEY - SAMPLE ANALYSES RESULTS

The laboratory results of the bacteriological examinations and chemical analyses of the samples collected from private wells and local drainage courses during the survey, are appended to this report. All bacteriological examinations were performed by the Regional Public Health Laboratory in Timmins. Chemical analyses were conducted at the Ontario Water Resources Commission Laboratory in Toronto.

A map of the community of Wyborn and vicinity showing the sampling point locations is appended to the report.

A privately-operated trailer park is located on the north side of Highway No. 11 to the north of the Wyborn townsite. Domestic waste disposal is accomplished using septic tank and tile bed systems. The clay soils in the area do not permit effective operation of sub-surface disposal facilities. As a result, domestic wastes from the trailer park are gaining access to a local roadside ditch which flows in a westerly direction along Highway No. 11 to a point approximately 3/4 of a mile from the trailer park where it discharges to a local creek.

Samples 4-D and 6-D were collected for bacteriological examination from the ditches which provide drainage from the trailer court. The examination results revealed fecal coliform organism

counts of 620,000 (4-D) and 40,000 (6-D) per 100 ml. of sample, with substantially higher total coliform organism counts in both samples.

A sample was also collected for chemical analyses at location 6-D. A biochemical oxygen demand (BOD₅) of 19 ppm was determined in the analyses.

Additional samples were collected from the same ditch at a location (14-D) further downstream near a small subdivision of approximately 7 homes. Coliform counts of 18,000 total and 150 fecal organisms per 100 ml. were present in the bacteriological sample. Chemical analyses of the sample revealed that an excessively high BOD₅ of 34 ppm was also present in the sample. The entire subdivision is serviced with individual septic tank systems.

A west branch tributary which drains to the ditch discussed above was also sampled during the field survey. Samples collected at location 9-D contained coliform counts of 90,000 total and 1,500 fecal organisms. These results were obtained from a roadside ditch which provides drainage for 4 homes that are serviced with individual septic tanks.

Sample 8-D was collected for bacteriological examination from the west branch tributary immediately downstream of the point at which the roadside ditch discharges to the watercourse. Bacteriological examination results revealed total and fecal coliform counts of 900 and 200 respectively. Another sample collected further down-

stream at location 7-D contained no coliform organisms. Chemical analyses results yielded a low BOD₅ from the same sample location. This would probably be due to the high dilution factor caused by surface runoff following a rainstorm which occurred prior to the field survey.

Sample 15-D was collected from a local ditch in the area west of the townsite of Wyborn. The bacteriological examination and chemical analyses results indicated a low coliform count of 130 total with no fecal organisms present, and a low BOD₅ of 1.4 ppm. It should be noted that there is no development in this area.

All of the watercourses discussed above converge to form a single drainage course which discharges to the Mattawishkwia River to the west (upstream) of the townsite of Wyborn and the Town of Hearst. Samples were collected from the drainage course at location 16-D for bacteriological examination and chemical analyses. The laboratory results indicate that 1,700 total and 310 fecal coliform organisms were present in 100 ml. of the sample. The BOD₅ at the same location was found to be 2.0 ppm which is not uncommon for this type of drainage course.

The laboratory results of a sample collected from the Mattawishkwia River at location 17-R revealed a fecal coliform count of six organisms per 100 ml. of sample. Such a low count is due to the high dilution factor of the river. However, the bacteriological examination results of the ditch samples draining to the river indicate that a considerable volume of domestic wastes are gaining access to the river.

A sample was collected at location 18-D from another ditch which also discharges to the Mattawishkwia River. The bacteriological examination results revealed coliform counts of 400 total and 200 fecal.

A third ditch which drains from a stagnant pond located immediately west of the Algoma Central Railway, was also sampled at location 19-D. The effluent contained no coliform organisms. It was observed that there is no development in the vicinity of the pond.

A fourth drainage ditch which discharges to the Mattawishkwia River flows through the developed section of the community of Wyborn. Samples were collected from the ditch at locations 21-D, 22-D, 33-D, and 34-D. The laboratory results indicate that the samples contained coliform counts ranging from 70 to 18,000 total organisms and 16 to 18,000 fecal organisms. Chemical analyses results of the samples revealed BOD₅ test results ranging from 5 to 16 ppm. These results indicate that the water quality of this drainage course was generally unsatisfactory from both bacteriological and chemical points of view.

Several of the samples discussed above were also analysed for concentrations of anionic detergents as ABS (alkyl benzene sulfonate) and phosphorus as P. Varying amounts of each were determined in the majority of the samples analysed, the results of which are included in Appendix II of the report. ABS and concentrations of phosphorus as P in excess of one ppm are commonly present in domestic wastes. Excessively high concentrations of each of these sanitary waste indicators was evident in a sample collected at location 6-D in a ditch downstream

of the trailer court on Highway No. 11.

VI DISCUSSION

During the field survey, visible evidence of domestic sewage was noted in the roadside ditches in the vicinity of the townsite, and the small groups of homes located near Highway No. 11. Unpleasant conditions were also noted in the roadside ditch located in front of the trailer court on Highway No. 11. Local residents reported that malodorous conditions develop each year during the warmer months of July and August.

This type of situation constitutes a public health hazard, particularly in areas where children play. Such conditions are also a potential threat to the private well systems within the area.

The heavy clay soil conditions which exist throughout the area do not allow satisfactory operation of septic tank and tile bed systems. If domestic waste disposal cannot be accomplished on an individual basis, a communal collector and treatment system should be considered. However, it must be realized that the scattered development throughout Wyborn and vicinity would dictate high costs on a per capita basis for complete servicing.

A preliminary engineering survey would be required to determine the economic feasibility of constructing communal sewage collector and treatment facilities.

VII SUMMARY AND CONCLUSIONS

A water pollution survey was conducted in the community of Wyborn and vicinity, in the unorganized township of Way, in June, 1971.

Sanitary waste disposal throughout the area is accomplished with individual subsurface disposal facilities, except for a few homes without plumbing where pit privies are utilized.

Heavy clay soil conditions in the area do not permit satisfactory operation of septic tank and tile bed systems. As a result, several of these facilities are discharging inadequately treated wastes, and in some cases raw sewage, to local roadside ditches and other drainage courses. These wastes eventually gain access to the Mattawishkwia River at a location upstream of the Town of Hearst municipal water supply intake structure.

The conditions discussed above constitute a potential public health hazard to the residents of Wyborn and vicinity and to the residents of the Town of Hearst.

VIII RECOMMENDATIONS

- (1) The residents of the community of Wyborn and vicinity should organize a committee to study the feasibility of constructing a communal sewage collector and treatment facility.
- (2) In the interim, the existing faulty subsurface disposal systems should be repaired to meet Department of Health standards under the guidance of the Porcupine Health Unit.

JWG/o

Prepared by J. W. Gilhooly.....
J. W. Gilhooly,
Technologist,
Division of Sanitary Engineering

A P P E N D I X I

WATER QUALITY AND EFFLUENT OBJECTIVES

The OWRC objectives for surface waters in Ontario are as follows:

5-day BOD-not greater than 4 ppm
Total coliform count-not greater
than 2,400 total coliform organisms
per 100 ml. of sample when only one sample
is obtained.

The corresponding objectives for plant effluents and other discharges to a watercourse are:

5-day BOD-not greater than 15 ppm
Suspended solids concentrations-not
greater than 15 ppm.

GLOSSARY OF TERMS

Bacteriological Examinations

The presence of fecal coliforms (FC) is indicative of pollution from human or animal excrement. The total coliform count represents the total number of coliform organisms present of both fecal and non-fecal origin.

The OWRC Laboratories employ the Membrane Filter (MF) technique of examination to obtain a direct enumeration of coliform organisms. The Department of Health Laboratories use the Most Probable Number (MPN) enumeration and coliform counts are reported as Total Coliform Organisms (TC) and Fecal Coliform Organisms (FC).

Sanitary Chemical Analyses

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (ppm) and is an indicator of the amount of oxygen required for the stabilization of decomposable organic or chemical matter.

Solids

The value for solids, expressed in parts per million, is the sum of the values for the suspended and the dissolved solids in the water. The concentration of suspended solids is generally the most significant to surface water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, decomposition in streams and injury to the habitat of fish.

Anionic Detergents as ABS

The alkyl benzene sulfonate (ABS) portion of the anionic detergents is reported in ppm. The test is generally employed to detect the presence of domestic wastes. The popular use of synthetic detergents for general cleaning purposes has resulted in the incidence of residual ABS in domestic waste discharges.

As an objective, the ABS concentration should not exceed 0.5 ppm in water used for domestic purposes.

Phosphorus as P

Detrimental concentrations of phosphorus are usually present in domestic sanitary wastes. Phosphorus discharges to streams and other watercourses often result in an overabundant growth of algae and undesirable odours, and may be injurious to the habitat of fish. It is pointed out that detergents are an increasingly important source of phosphorus pollution.

It is suggested that a concentration of 0.01 ppm of inorganic (or soluble) phosphorus is the maximum value permissible without the danger of supporting undesirable growths.

A P P E N D I X I I

TOWNSHIP OF WAY

COMMUNITY OF WYBORN

BACTERIOLOGICAL EXAMINATION OF WELL WATER

NO. PER 100 ML

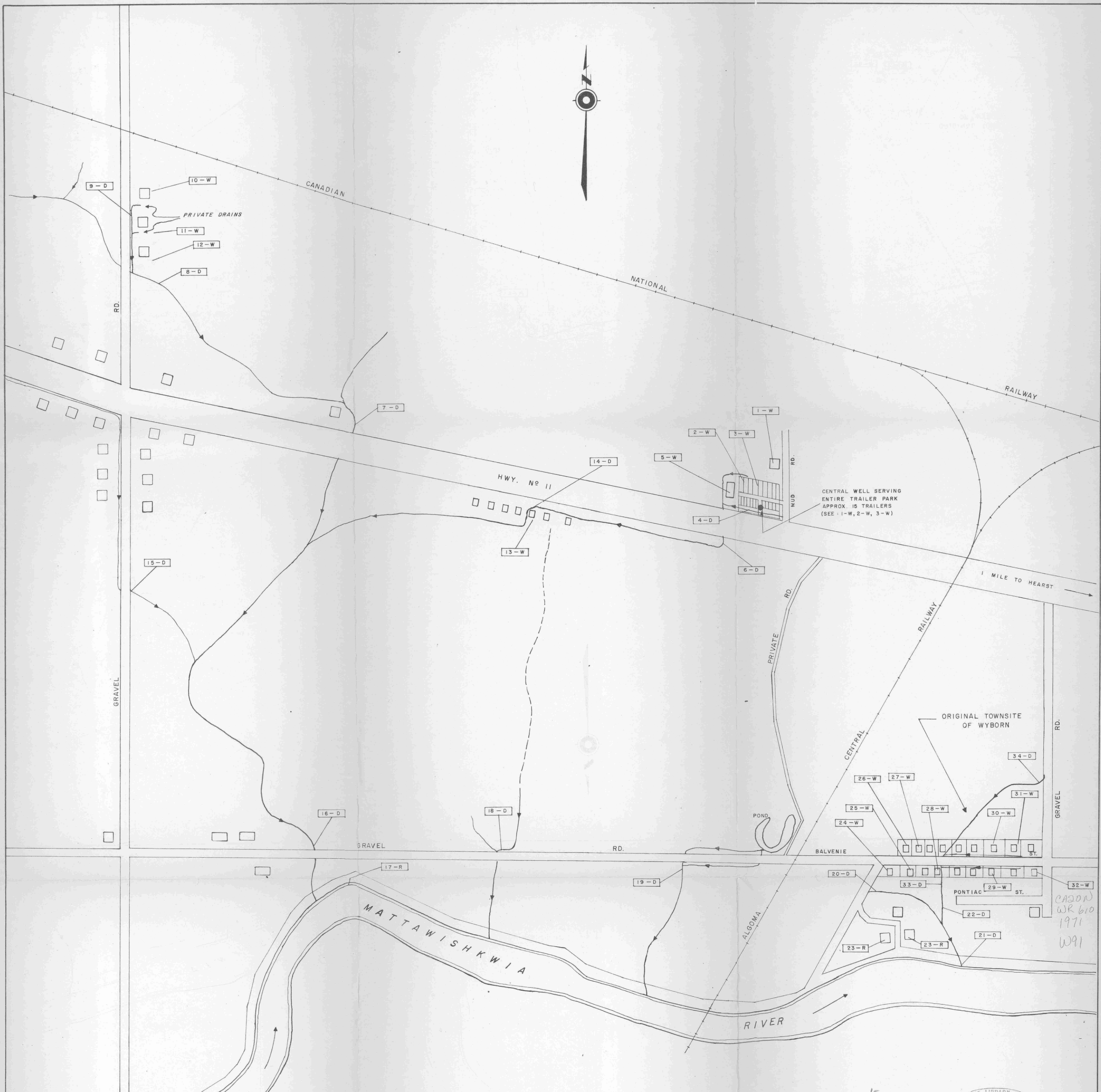
<u>SAMPLING POINT LOCATION</u>	<u>MPN COLIFORM COUNT</u>	
	<u>TOTAL ORGANISMS</u>	<u>FECAL ORGANISMS</u>
1 - W	0	0
2 - W	0	0
3 - W	0	0
5 - W	80 ⁺	80 ⁺
10 - W	18	0
11 - W	0	0
12 - W	0	0
13 - W	0	0
24 - W	0	0
25 - W	0	0
26 - W	0	0
27 - W	0	0
28 - W	0	0
29 - W	0	0
30 - W	0	0
31 - W	0	0
32 - W	0	0

TOWNSHIP OF WAY

COMMUNITY OF WYBORN

SURFACE WATERCOURSES

SAMPLING POINT LOCATION	DESCRIPTION	DATE SAMPLED	BOD ₅ (PPM)	S O L I D S			ANIONIC DETERGENTS As ABS (PPM)	PHOSPHORUS As P (PPM)	MPN COLIFORM COUNT	
				TOTAL (PPM)	SUSP. (PPM)	DISS. (PPM)			TOTAL ORGANISMS	FECAL ORGANISMS
4 - D	DITCH IN FRONT OF TRAILER COURT	JUNE 1/71							8,000,000+	620,000
6 - D	DITCH DOWNSTREAM OF TRAILER COURT	"	19.0	560	10	550	0.9	7.1	50,000	40,000
7 - D	LOCAL CREEK NORTH OF HWY. NO. 11	"	2.0	140	5	135	0.0	.18	900	200
8 - D	LOCAL CREEK DOWNSTREAM OF PRIVATE SANITARY OUTFALLS.	"							0	0
9 - D	DITCH IN VICINITY OF SEPTIC TANK OUTFALLS.	"							90,000	1,500
14 - D	DITCH ON SOUTH SIDE OF HWY. NO. 11.	"	34.0	565	15	550	0.1	1.9	18,000	150
15 - D	WEST BRANCH TRIBUTARY OF LOCAL CREEK.	"	1.4	70	5	65	0.0	0.05	130	0
16 - D	LOCAL CREEK NEAR POINT OF DISCHARGE TO MATTAWISHKWA RIVER.	"	2.0	130	5	125	0.0	0.06	1,700	310
17 - R	MATTAWISHKWA RIVER DOWNSTREAM OF CREEK OUTFALL	"	1.8	80	5	75	0.1	0.02	6	6
18 - D	DRAINAGE FROM LOCAL FIELD TO MATTAWISHKWA RIVER	"							400	200
19 - D	DRAINAGE FROM LOCAL POND TO MATTAWISHKWA RIVER	"							0	0
20 - D	DITCH WITHIN ORIGINAL WYBORN TOWNSITE	"	1.4	300	5	295	0.1	0.055	0	0
21 - D	TOWNSITE DITCH OUTFALL TO MATTAWISHKWA RIVER	"	5.0	340	10	330	0.0	0.75	2,000	290
22 - D	COLLECTOR DITCH WITHIN TOWNSITE	"	5.0	270	5	265	0.1	0.75	900	600
23 - R	MATTAWISHKWA RIVER	"							40	0
33 - D	COLLECTOR DITCH AT SOUTH END OF TOWNSITE	"	16.0	260	10	250	0.1	1.6	18,000	18,000
34 - D	COLLECTOR DITCH AT NORTH END OF TOWNSITE	"	5.5	430	50	380	0.1	0.095	70	16

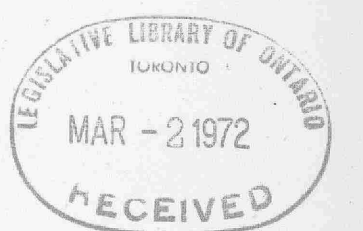


LEGEND

SAMPLING STATION LOCATIONS

- 4-D - DRAINAGE DITCH
- 17-R - RIVER
- 2-W - WELL

at Environs Water Treat



ONTARIO WATER RESOURCES COMMISSION	
TOWNSHIP OF WAY COMMUNITY OF WYBORN WATER POLLUTION SURVEY JUNE 1971	
SCALE: 400 0 400 800 FT.	
DRAWN BY: L.L. BROOME	DATE: JULY, 1971
CHECKED BY: J.G.	DRAWING NO: 71-60-DE

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